

Claims

[c1] What is claimed is:

1.A method for controlling an instruction memory (IM) of an embedded system, wherein the embedded system is electrically connected to a memory device used for storing a plurality of program code segments, and the embedded system comprises:

the instruction memory for receiving and registering the program code segments stored in the memory device;
and

an execution unit for executing the program code segments; the method comprising the following steps:

(a) setting up a look-up table for recording an operation status of the instruction memory;

(b)selecting a specific program code segment from the program code segments and executing the specific program code segment with the execution unit;

(c) determining if the specific program code segment has been stored in the instruction memory according to the look-up table before performing step (b);

(d)reading the specific program code segment from the instruction memory to execute with the execution unit if the result of step (c) is true; and

(e)loading the specific program code segment from the memory device to execute with the execution unit if the result of step (c) is false.

[c2] 2.The method of claim 1, wherein step (e) further comprises the following step:

(f)storing the specific program code segment into the instruction memory and refreshing a record of the look-up table for recording that the specific program code segment has been stored in the instruction memory.

[c3] 3.The method of claim 2, wherein step (e) further comprises the following steps:

(g)checking if the instruction memory has enough space for storing the specific program code segment before performing step (f) to store the specific program code segment into the instruction memory;

(h)storing the specific program code segment into the instruction memory if the result of step (g) is true; and

(i)overlapping the instruction memory with the specific program code segment if the result of step (g) is false.

[c4] 4.The method of claim 3, wherein step (i) further comprises the following step:

(j)refreshing the look-up table to record that the specific program code segment has been stored into the instruction memory and another program code segment origi-

nally stored in the instruction memory has been erased.

[c5] 5.The method of claim 1, wherein execution of steps (a) to (e) is controlled by the execution unit.

[c6] 6.The method of claim 1, wherein the embedded system is electrically connected to a host, the host comprising a control circuit for controlling the execution of steps (a) to (e).

[c7] 7.The method of claim 1, wherein each of the program code segments comprises a plurality of instructions.

[c8] 8.The method of claim 1, wherein the execution unit is an application specific integrated circuit (ASIC).

[c9] 9.The method of claim 1, wherein the embedded system is used for encryption or decryption.

[c10] 10.The method of claim 1, wherein the look-up table is set up in the memory device.

[c11] 11.The method of claim 1, wherein the look-up table is set up in the instruction memory.